

INTERNATIONAL SEARCH REPORT

International Application No
PCT/JP 03/11799

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B01J19/32 F28F25/08 F28F25/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B01J F28F B01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 224 351 A (JEANNOT PIERRE ET AL) 6 July 1993 (1993-07-06) abstract column 7, line 45 - line 61; figure 10 column 6, line 23 - line 64; figures 5,7 ---	1-13
X	EP 0 997 189 A (AIR PROD & CHEM) 3 May 2000 (2000-05-03) abstract column 7, paragraph 41 - paragraph 42; figures 4,5 ---	1,13
A	column 7, paragraph 41 - paragraph 42; figures 4,5 ---	2-12
X	EP 0 916 400 A (PRAXAIR TECHNOLOGY INC) 19 May 1999 (1999-05-19) abstract page 2, paragraph 4; figure 2 ---	1,13
A	---	2-12
	-/-	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

19 January 2004

Date of mailing of the international search report

26/01/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Thomasson, P

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 03/11799

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01 28648 A (MANTEUFEL ROLF P C) 26 April 2001 (2001-04-26) abstract; figure 1 -----	1-13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 03/11799

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US 5224351	A 06-07-1993	FR 2670394 A1		19-06-1992
		FR 2672815 A1		21-08-1992
		FR 2673457 A1		04-09-1992
		FR 2676371 A1		20-11-1992
		AU 652401 B2		25-08-1994
		AU 8963891 A		18-06-1992
		CA 2057509 A1		18-06-1992
		DE 69119731 D1		27-06-1996
		DE 69119731 T2		14-11-1996
		EP 0491591 A1		24-06-1992
		EP 0664144 A2		26-07-1995
		EP 0665042 A2		02-08-1995
		ES 2087268 T3		16-07-1996
		JP 6142401 A		24-05-1994
		US RE36577 E		22-02-2000
		ZA 9109852 A		30-09-1992
EP 0997189	A 03-05-2000	BR 9904406 A		08-08-2000
		CN 1253028 A		17-05-2000
		EP 0997189 A1		03-05-2000
		JP 2000107589 A		18-04-2000
		KR 2000028745 A		25-05-2000
		PL 335794 A1		10-04-2000
EP 0916400	A 19-05-1999	US 5700403 A		23-12-1997
		EP 0916400 A1		19-05-1999
WO 0128648	A 26-04-2001	AU 7274300 A		30-04-2001
		DE 10051523 A1		10-05-2001
		DE 10083141 D2		07-11-2002
		WO 0128648 A1		26-04-2001
		JP 2003512144 T		02-04-2003
		AU 6599301 A		26-11-2001
		WO 0187448 A1		22-11-2001
		JP 2003533340 T		11-11-2003
		US 2003111744 A1		19-06-2003